Credit Ratings and Managerial Voluntary Disclosures

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Abstract: This study investigates whether managers influence credit ratings via voluntary disclosures. I find that firms near a rating change have a higher incidence of a disclosure regarding product and business expansion plans. This finding is more evident for firms that are subject to lower proprietary costs of disclosures, which implies that managers do trade off both the benefits and costs of the disclosures. I find no evidence that firms close to a rating change selectively release good news or suppress bad news on product and business expansion. Overall, my results suggest that firms generally exhibit a credible commitment to maintaining disclosure transparency for a desired credit rating.

***Keywords*:** credit ratings; information transparency; commitment to disclosures; product and business expansion plans

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1. Introduction

Credit ratings are important for a firm due to their impact on stock and bond valuations and to the regulatory and contractual costs (benefits) associated with a credit rating change (Kisgen, 2006). Thus, managers have an incentive to maintain or achieve a desired credit rating through influencing rating agencies' perceptions about corporate creditworthiness. Existing literature shows that the costs (benefits) associated with a credit rating change affect managerial capital structure decisions (e.g., Kisgen, 2006; Kisgen, 2007; Kisgen, 2009) and corporate financing choices (Hovakimian, Kayhan, and Titman, 2010), and that firms tend to adjust leverage to influence rating agencies' decisions. However, leverage is not the only concern for rating agencies in determining a firm's credit rating. The rating process also requires analysis of publicly disclosed corporate information that is associated with a firm's creditworthiness (Standard & Poor's, 2009).

The objective of this study is to investigate how managers take advantage of voluntary disclosures to fulfil their incentives for a desired credit rating. I address this issue by probing managers' disclosure strategies that are in response to an impending credit rating change. In this study, firms close to a rating change are defined as those near a threshold credit category per Kisgen (2006).[1] I focus on disclosures as to product and business expansion (hereafters, PBE) plans for two reasons. First, every firm has PBE plans and their announcements occur frequently in practice (Nichols, 2010); hence, the focus on PBE disclosures facilitates a large sample analysis. Second, PBE disclosures represent a typical form of voluntary disclosure that implies long-term streams of a firm's future earnings. As a credit rating is meant to discriminate a firm's credit risk on a long horizon (Altman and Rijken, 2004; Standard & Poor's, 2009; Hovakimian, Kayhan, and Titman, 2010), PBE disclosures might substantially affect rating decisions.[2] Furthermore, PBE

[1] The precise definitions used for empirical analysis are described on pages 4-5.

[2] As stated by Standard & Poor's rating agency, "*credit ratings are meant to be forward-looking in measuring*

plans are discussed, ascertained, and finalized internally by management and then released publicly. To ensure stability of credit ratings, rating agencies tend not to rely on uncertain corporate information in their credit analyses. Even if a firm releases its PBE plans privately to the rating agencies, the plans might not be factored into credit ratings until after the public announcements of those plans. Hence, it is likely that impending credit rating changes influence managers' public disclosure strategies regarding PBE plans.

Rating agencies rely critically on projected future cash flow to assess a firm's ability to meet financial obligation. A decrease in information asymmetry between insiders and outsiders has positive effects on a firm's future cash flow, thereby increasing a firm's creditworthiness perceived by rating agencies (e.g., Ashbaugh-Skaife, Collins, and LaFond, 2006). The positive effects lie along three dimensions. First, a decrease in information asymmetry mitigates agency risk faced by all external stakeholders. For example, low information asymmetry that facilitates the monitoring of management practices could curb opportunistic management behavior that decreases firm value and promote better managerial decision-making that increases firm value. Low information asymmetry is conducive to establishing or maintaining a robust supplier-customer relationship, helping a firm generate sustainably high profits. Second, low information asymmetry enables a firm to raise full capital as planned on a timely basis, so that the firm would not miss out on some promising investment opportunities to enlarge future profits. Third, a decrease in information asymmetry reduces outside investors' estimation risk and thereby lowers a firm's cost of capital (e.g., Easley and O'Hara, 2004; Lambert, Leuz and Verrecchia, 2012).

Prior literature (e.g., Lev and Penman, 1990; Welker, 1995; Dhaliwal, Li, Tsang, and Yang, 2011) shows that managers could voluntarily disclose value-relevant information to outsiders to

long-term credit risk and the time horizon extends as far as is analytically foreseeable" (Standard & Poor's, 2009).

reduce information asymmetry between insiders and outsiders. Hence, voluntary disclosure is an instrument through which managers may influence credit ratings. PBE disclosure is such an instrument, in that it has implications for long-term streams of a firm's future earnings and reduces information asymmetry. As rating agencies claim to have incorporated information transparency into the assessment of a firm's creditworthiness, firms that wish for a desired credit rating would be more likely to disclose their PBE plans. These disclosures also reduce the uncertainty of whether a firm would follow through with its plans, thereby reduce rating agencies' estimation risk in respect to a firm's future cash flow, and in turn, increase a firm's creditworthiness perceived by rating agencies.

Rating agencies face widespread criticism for their failure to adjust for opportunistic corporate reporting (e.g., SEC, 2003). They generally do not conduct audits or due diligence reviews of client-provided information. So, managers with an incentive to pursue a desired credit rating might selectively disclose good news in the belief that rating agencies might not be able to undo and adjust for the selective good news disclosures. Rating agencies, should they fail to undo a firm's selective good news disclosures, would perceive the firm as having high information transparency and low credit risk. However, a credit rating is maintained by a firm for long time, which constitutes a repeated game between managers and rating agencies. In repeated games, managers can benefit from building up a reputation for credible disclosures (Stocken, 2000; Beyer, Cohen, Lys, and Walther, 2010). By contrast, if managers selectively release good news or suppress bad news, this might temporarily deceive rating agencies, but would be penalized for the cheating once it is detected. In the case of such detection, the firm would be perceived as lacking information transparency in spite of the incidence of the good news disclosures. Therefore, conditional on a manager's decision to voluntarily disclose PBE plans, whether he/she would

selectively release good news or suppress bad news for a desired credit rating becomes an empirical question. I investigate this as an exploratory analysis. Following prior literature (e.g., Noe, 1999; Cheng and Lo, 2006; Brockman, Khurana, and Martin, 2008; Ge and Lennox, 2011; Nichols, 2010), I measure the nature of disclosure news by the announcement returns over its three-day event window.

The credit rating scale consists of ten broad rating categories (i.e., AAA, AA, A, BBB, BB, B, CCC, CC, C, D) which respectively represent ten different qualitative indicators for a firm's credit risk (Standard & Poor's, 2009). Each broad rating category from AA to CCC is further divided into three subcategories with a distinction of minus, middle, and plus specifications (e.g., BB+, BB, and BB-). Following Kisgen (2006), I use two constructs to identify firms that have differential incentives to maintain or achieve a desired credit rating. First, I allow for three rating statuses for each specific notch rating (e.g., BB+)[3], that is, whether a firm is near a rating upgrade (downgrade) to a higher (lower) adjacent specific notch rating or not near any notch rating change. I rank firms by quintiles within each specific notch rating based on the credit-quality determinants. The top and bottom quintiles of firms within a specific credit rating are classified as near a notch rating change and hence are more likely to maintain or achieve a desired rating level than firms in the middle quintiles which are classified as not near a notch rating change. Second, I classify firms as near a broad rating change if their ratings are designated with a plus or minus notch within a broad rating and not near a broad rating change if the firms do not have a plus or minus notch within the broad rating. Due to regulatory and contractual factors related to a broad rating, the costs (benefits) associated with a broad rating change (e.g., BB+ to A-) are greater than the costs

[3] A notch credit rating includes a minus or plus notch, if given. A notch rating change refers to a change in the rating of any kind, including both a rating change between two notch ratings within the same broad rating category (e.g., AA to AA+) and a rating change between two notch ratings across two adjacent broad rating categories (e.g., AA+ to AAA-). A broad rating change refers only to the latter.

(benefits) associated with a notch rating change within the same broad rating category (e.g., BB- to BB, or BB to BB+). Therefore, firms that have ratings at the top or bottom notch of a broad rating category (e.g., BB+, BB-) should, on average, have a stronger incentive to influence ratings than firms that have ratings in the middle of the broad rating category (e.g., BB).

After controlling for a wide array of disclosure determinants, I find that firms near a credit rating change are more likely to release PBE plans. This result is more evident for firms that are subject to lower proprietary costs of disclosures. This implies that managers tend to trade off both the benefits and costs of the PBE disclosures. I do not find that firms close to a rating change selectively release good news or withhold bad news on PBE information. Collectively, the results suggest that firms generally exhibit a credible commitment to maintaining disclosure transparency for a desired credit rating. I further find that an increase in PBE disclosures raises the probability of a credit-rating upgrade in subsequent periods, suggesting that rating agencies favor firms that commit to high disclosure transparency.

This study contributes to the literature in several ways. First, prior literature investigates the impact of managerial incentives on corporate disclosures in the setting of equity offerings (Frankel, McNichols, and Wilson, 1995; Marquardt and Wiedman, 1998; Lang and Lundholm, 2000; Kim, 2016), stock repurchases (Brockman, Khurana, and Martin, 2008), management buyout offers (Hafzalla, 2009), stock-for-stock mergers (Ge and Lennox, 2011), stock and stock option grants (Aboody and Kasznik, 2000; Nagar, Nanda, and Wysocki, 2003), and insider trading (Bushman and Indjejikian, 1995; Rogers and Stocken, 2005; Cheng and Lo, 2006; Rogers, 2008; Cheng, Luo, and Yue, 2013). Nevertheless, despite the importance of credit rating to a firm, little research attention has been paid to managers' use of voluntary disclosures to influence credit ratings. This study fills this gap in the literature. Unlike the prior studies which find managerial incentives to

engage in false or misleading disclosures, I find no such evidence in the setting of impending credit rating changes.

Second, this study is the first to establish the link between credit ratings and nonfinancial disclosures. Though nonfinancial disclosures of PBE plans occur frequently in practice, little is known on the determinants of these disclosures, especially the role of managerial incentives. This study fills this void and demonstrates the importance of credit rating in managerial choice of nonfinancial disclosures.

Third, the existing credit rating literature focuses primarily on the determinants of credit rating as well as its informational role in the financial marketplace. In contrast, few studies shed light on how managerial incentives for a desired credit rating influence corporate decisions. This study contributes to this literature by providing the first evidence on how credit rating affects a firm's voluntary disclosure behaviors. By showing how managers disclose corporate information to influence credit ratings, this study provides important implications for credit rating agencies as well as other market participants, who need to evaluate a firm's credit quality and viability via corporate disclosures.

The remainder of the paper proceeds as follows. Section 2 develops the hypotheses. Section 3 describes the data. Section 4 presents the research methodologies. Section 5 discusses the empirical results. Section 6 conducts the supplemental analyses, and Section 7 concludes.

2. Literature review and hypothesis development

2.1. Why do managerial voluntary disclosures matter for credit ratings?

Credit rating analyses typically take into account plenty of information publicly released by a firm. A firm can provide rating agencies with private information for reference. However,

publicly released information is of first-order importance to rating agencies in the evaluation of a firm's credit quality for two reasons.

First, rating agencies are not obliged to audit the accuracy or integrity of client-provided information. Nor are rating agencies prone to do so, since the verification of the information would incur increased costs to rating agencies, who only receive a given amount of rating fees from their clients as service revenues.[4] In that case, the inherent credibility of client-provided information becomes vital for rating agencies in the rating process. Managers hold no legal liability for privately releasing false or misleading information to rating agencies. By contrast, publicly disclosed information is subject to oversights from both external stakeholders and legal authorities. In such a sense, the public disclosures are more convincing than the private communications (e.g., Bushman, Piotroski, and Smith, 2004; Armstrong, Guay, and Weber, 2010).

Second, publicly released corporate information could influence the expected value of a firm's future cash flow through establishing and/or altering market expectations. The change in the expected future cash flow would then alter a rating agency's assessed level of the firm's creditworthiness. However, increasing information transparency to the public or affecting market expectations to increase the expected value of future cash flow cannot be achieved by privately communicating corporate information to rating agencies.

Research (e.g., Ashbaugh-Skaife, Collins, and LaFond, 2006; Yu, 2005) shows that credit rating agencies are concerned about the extent of information asymmetry between management and external stakeholders when evaluating a firm's creditworthiness. The reasons are three-fold.

[4] I inquired of Standard & Poor's rating agency about this issue. The response is that "*If our clients cheat (and as we are not auditors, nor insiders, we can be cheated, and have been), in the future these entities may see their access to funds more limited and/or expensive than otherwise. These entities have potentially large and anonymous stakeholders base from which the entities are subject to scrutiny. Still, we always try to have a healthy skeptical view over the client-provided information."*

First, information asymmetry increases agency risk faced by all external stakeholders, which decreases the expected value of future cash flow to a firm. The decrease in the projected cash flow then raises default risk, resulting in a lower credit rating for the firm. For instance, information asymmetry generates a moral hazard problem in which managers pursue their own interests through shirking, consumption of perquisites, overcompensation, or empire building. These self-interested managerial behaviors would decrease the projected cash flow of a firm. A customer that has high information asymmetry with its supplier is often subject to more stringent sales credit terms from the supplier. The stringent credit terms impair the customer's liquidity position and lower the efficiency of the customer's operating activities, thereby reducing its future profits.

Second, information asymmetry between insiders and outsiders brings about adverse selection costs to a firm. The disclosure literature (e.g., Milgrom, 1981; Verrecchia, 1983; Hollander, Pronk, and Roelofsen, 2010) provides strong support for the proposition that investors tend to equate no news with bad news. Absence of any disclosure induces investors to rationally infer that a firm's asset value is low or of high risk (Grossman, 1981; Beyer, Cohen, Lys, and Walther, 2010). The lack of information transparency hinders a firm from financing its investments and operations in a timely manner, resulting in loss of future profits.

Third, information asymmetry between insiders and outsiders induces uncertainty (i.e., the conditional variance of a firm's expected future cash flow) (Merton, 1974) and information risk (Easley and O'Hara, 2004), which increase the probability of default (Francis, LaFond, Olsson, and Schipper, 2005; Mansi, Maxwell, and Miller, 2011). Less informed investors charge a higher risk premium for the information asymmetry, thereby raising the firm's cost of capital (e.g., O'Hara, 2003; Easley and O'Hara, 2004; Hughes, Liu, and Liu, 2007).

Voluntary disclosures could induce better credit ratings for a firm (Yu, 2005) due to the role disclosures play in reducing information asymmetry (Lennox and Park, 2006; Dhaliwal, Li, Tsang, and Yang, 2011). Therefore, managers have incentives to make use of voluntary disclosures to maintain or achieve a desired credit rating. In this study, I look at the public announcements of PBE plans. Product information disclosures are defined as disclosures of plans that relate to the introduction, change, improvement, or discontinuation of a company's products or services. Business expansion plan disclosures relate to an increase in a firm's current operations through internal growth, such as entering into new markets with existing products, opening a new branch, establishing a new division, increasing production capacity, or investing additional capital in the current business, but exclusive of growth by merger and acquisition.[5] Appendix II provides examples of PBE plans. These corporate business plans are discussed, ascertained, and finalized internally, and then voluntarily announced through press releases or news outlets. In maintaining rating stability, rating agencies usually do not rely on uncertain corporate information in their credit risk assessments. Credit ratings are updated only when rating agencies are confident that observed changes in a firm's risk profile are ascertained (Altman and Rijken, 2004; Hovakimian, Kayhan, and Titman, 2010). Hence, even if a firm conveys PBE plans to its rating agency in private, the rating agency would likely not factor such plans into the firm's credit rating until after the public announcement of the plans. The discussion above leads to a hypothesis I maintain for this study, which is that credit ratings are related to voluntary disclosures of PBE plans.

I focus on public disclosures, a particularly important channel which affects rating agencies' perceptions about a firm's creditworthiness. I do not claim that private communications do not matter to credit ratings. Rather, it is interesting to look at how private communications would

[5] The definitions of the PBE disclosures follow Capital IQ, a division of Standard and Poor's.

change in response to an impending credit rating change, because private information might complement public information in influencing rating agencies' perceptions on corporate credit risk. But private communications are unobservable to outsiders, which remains a substantive challenge for academic research. I leave this issue as an avenue for future research.

2.2. Development of hypothesis 1

Nichols (2010) finds that voluntary disclosures of PBE plans trigger positive, three-day abnormal stock returns of 30-60 basis points on average, suggesting that these disclosures likely provide value-relevant good news to the public. PBE plans have strong implications for long-term streams of a firm's future earnings and thus are incorporated into credit analyses by rating agencies. As discussed in Section 2.1, public release of PBE information could reduce information asymmetry between management and external stakeholders, thereby leading to a firm's higher creditworthiness. Furthermore, since PBE plans are discussed and ascertained before released to the public, the disclosures reduce rating agencies' uncertainty about a firm's strategic planning; this decreases the rating agencies' estimation risk with respect to the firm's future cash flow, and in turn, increases the rating agencies' perceived creditworthiness about the firm. Therefore, firms that wish for a desired credit rating should have an incentive to commit to disclosing their PBE information. The discussion above leads to the following hypothesis.

H1: *Ceteris paribus, the incidence of a disclosure as to PBE plans is higher for firms that have a stronger incentive to maintain or achieve a desired credit rating.*

It is usually too costly for a firm to keep its disclosures sticky. The proprietary costs of disclosures, for instance, may be high, which deters a firm from publicly releasing its PBE plans. So presumably, a firm would trade off both the benefits and costs of PBE disclosures. If the

proprietary costs exceed the benefits of maintaining or achieving a desired credit rating for a firm, the firm would not disclose its PBE plans. Therefore, I have the following supplemental hypothesis.

H1a: *The association between managerial incentive to maintain or achieve a desired credit rating and the incidence of a disclosure as to PBE plans, as hypothesized in H1, is more evident for firms that have lower proprietary costs of disclosure.*

2.3. Development of hypothesis 2

The incidence of a corporate disclosure is a necessary condition for a firm to maintain information transparency with outsiders in that a firm with no corporate disclosure would be factually perceived by all the outsiders as lack of information transparency. However, the incidence of information disclosure by itself does not guarantee information transparency perceived by outsiders unless the information is disclosed completely (i.e., both good news and bad news are disclosed once received). Given managers' ex ante pre-commitment to voluntary disclosure, they could commit to selectively releasing good news or suppressing bad news. On the one hand, if outsiders of interest are sophisticated enough to see through selective good news disclosures of a firm, they would still perceive the firm as having low information transparency despite the existence of the good news disclosures. In this scenario, the firm is prone to commit to full disclosures which involve not only good news but also bad news. On the other hand, if outsiders are unable to discern selective good news disclosures of a firm, they would regard the firm as having high information transparency. In this case, the firm would have an incentive to disclose its information selectively. Overall, whether a manager would disclose corporate information in a complete or selective fashion to fulfill his/her incentives depends on whether, in the manager's mind, outsiders of interest can undo the selective disclosures, and hence is an open

question to us. I probe this empirical question in the setting where managers have an incentive to maintain or achieve a desired credit rating.

Nondisclosure could occur either because information sender is not informed of any news or because the sender is attempting to conceal bad news (Dye, 1985; Jung and Kwon, 1988), making it relatively difficult for outsiders to unravel a firm's bad news hoarding. In this regard, managers might withhold bad news. However, managers are responsible for the introduction, change, improvement, and discontinuation of products or services and for business expansion. Hence, managers are supposed to know about the PBE news whenever it comes up, and if so, subsequent revelation of bad news on PBE would imply that managers have withheld the bad news.

Rating agencies deal with their clients repeatedly and frequently in the long run and are familiar with their clients' financial, economic, and operational statuses. Rating agencies are arguably specialized and sophisticated in acquiring and processing corporate information (Kisgen, 2006). Hence, rating agencies should be able to infer bad news withheld by managers. In this case, managers will not withhold bad news. Otherwise, their firm's stocks will be discounted not only for the bad news, but also for the discovery of opportunistic withholding behaviors.

Even if rating agencies fail to discover bad news hoarding in the short term, a firm cannot withhold bad news for long. There exists an upper limit where it becomes too costly or difficult for managers to withhold the bad news any longer (Kothari, Shu, and Wysocki, 2009), but managers usually cannot anticipate when the upper limit point arrives (He, 2015). Once the tipping point is reached, all the stockpiled bad news will come out all at once, resulting in a sudden, drastic decline in stock price, which is termed a stock price crash. Studies (e.g., Jin and Myers, 2006; Hutton, Marcus, and Tehranian, 2009; Kim, Li, and Zhang, 2011) demonstrate that withholding bad news leads to a stock price crash. Once a stock price crash of a firm occurs, rating agencies

would realize that the firm has withheld bad news. As a result, the firm would be penalized by a credit rating downgrade to an even larger extent. Therefore, it is likely that a firm wishing for a desired credit rating would not selectively release good news or withhold bad news about their PBE plans. This leads to the second hypothesis formulated in a null form as follows.

H2: *The likelihood of a good news disclosure (relative to that of a bad news disclosure) of PBE plans does not differ between firms with an incentive to maintain or achieve a desired credit rating and firms lacking the incentive to do so, conditional on the firms delivering the disclosure.*

The null hypothesis, H2, implies that firms with an incentive to maintain or achieve a desired credit rating do not selectively release good news or suppress bad news in their PBE plans. However, if firms that wish for a desired credit rating tend to selectively release good news or withhold bad news in their PBE disclosures, the likelihood of a good news disclosure (relative to that of a bad news disclosure) of these plans should be significantly higher for firms with an incentive to influence credit ratings than for firms lacking the incentive to do so.

3. Data

The empirical analysis is conducted based on data gathered primarily from four sources: I/B/E/S, Compustat, CRSP, and Capital IQ. I draw the PBE disclosure data from Capital IQ which maintains a team of over 600 analysts who collect and code key developments for all U.S. publicly listed firms. Capital IQ has data on a variety of key corporate developments, including corporate guidance, product announcements, and business expansion announcements. I restrict my focus to press releases to ensure that the announcements were initiated by firms. The announcements of PBE plans pertain to stand-alone disclosures that exclude other types of information disclosures. Due to the availability of the PBE disclosure data, I restrict my sample period to 2002-2009. Panels

A and B of Table 1 report the distribution of the incidence of PBE disclosures by year and industry, respectively. Firms in the industry of computer equipment & services and of electronic equipment have the highest incidence of PBE disclosures.

For firm credit ratings, I use the Standard & Poor's long-term domestic issuer credit ratings reported by Compustat.[6] Unlike bond-level credit ratings, firm-level credit ratings are maintained with a firm on a regular basis for a long term. So, the credit ratings in my sample are all "regular" ratings, not "ad hoc" ratings. Panel C of Table 1 shows the full sample distribution of credit ratings at the firm-quarter level. The majority of observations in the sample fall within the credit rating level from BB- to BBB+, with BBB level observations accounting for the highest percentage (12.77%). Panel D presents the distribution of credit ratings by year. The percentage of observations rated from A- to AAA relative to the percentage of observations rated from BBB+ to B- decreases over years. This suggests that rating agencies have become more conservative over time in the period of 2002-2009, which is consistent with Baghai, Servaes, and Tamayo (2014).

4. Research design

4.1. Measures of impending credit rating changes

As argued by Kisgen (2006), given the costs (benefits) associated with a credit rating change, a firm near a rating downgrade has an incentive to maintain its existing rating while a firm near an upgrade has an incentive to obtain an upgrade to be pooled with firms in a higher rating category. Following Kisgen (2006), I use two constructs to measure managerial differential incentives to

[6] Credit ratings issued by different rating agencies do not vary systematically across firms, and thus, a vast credit rating literature (e.g., Ashbaugh-Skaife, Collins, and LaFond, 2006; Kisgen, 2006; Kisgen, 2007; Kisgen, 2009; Kisgen and Strahan, 2010; Avramov, Chordia, Jostova, and Philipov, 2009; Baghai, Servaes, and Tamayo, 2014) focuses on credit ratings issued by a particular rating agency. I follow this literature to focus on credit ratings issued by S&P credit rating agency.

maintain or achieve a desired credit rating. The first construct relates to the discrete costs (benefits) associated with a specific notch rating change. Three rating statuses are considered for each specific notch rating level of a firm (e.g., BBB+), that is, whether a firm is close to a change to an adjacent higher or lower specific notch rating (e.g., BBB+ to A- or BBB+ to BBB), or not near a notch rating change. Firms, ranked in the top (bottom) quintile within each specific notch rating based on the credit-quality determinants at the beginning of a fiscal quarter, are classified as near a notch rating upgrade (downgrade).[7] The credit-quality determinants incorporate firm size, the ratio of debt to the market value of equity, the ratio of EBIT to total assets, and the ratio of total liabilities to total assets. I first estimate a pooled regression of credit rating on those credit-quality determinants. The credit rating is transformed into a numerical score using an ordinal scale that ranges from 1 for the lowest-rated firms (D) to 22 for the highest-rated firms (AAA). The regression results (not tabulated) reveal that the coefficients on each of the explanatory variables are in the predicted sign and are highly significant at the 1% level, and that the adjusted R^2 equals 48.60%. I then sort the observations into quintiles within each notch credit rating, based on the magnitude of the fitted value from the regression.[8] Observations in the top (bottom) quintile are classified as near a notch rating upgrade (downgrade), while observations in the middle three quintiles are classified as the benchmark group which is regarded as not close to a notch rating change. Firms in the top and bottom quintiles should exhibit greater propensity to maintain or achieve a desired credit rating than firms in the middle quintiles.

[7] I also check the robustness of this definition by specifying firms close to a notch rating change as the top and bottom thirds within a notch rating. Results remain qualitatively the same under this alternative specification.

[8] Following Kisgen (2006), I sort financial firms (SIC codes 6000-6499) and utilities firms (SIC codes 4000-4999) separately since these firms are subject to different rating criteria (Standard and Poor's, 2009). The approach of classifying an impending notch rating change for a firm is subject to errors-in-variables problem. However, since the magnitude of the fitted value is used to group firms into high and low quintiles and to create dummies based on the grouping, the errors-in-variables problem is mitigated (Kisgen, 2006).

The second construct relates to the discrete costs (benefits) associated with a broad rating change. Firms whose credit ratings are designated with a plus (minus) notch are considered as being close to a broad rating upgrade (downgrade). Given a higher likelihood of being upgraded (downgraded) to an adjacent higher (lower) broad rating category for firms rated in the outer notches (e.g., BB+ (BB-)) than for firms rated in the middle notch (e.g., BB), the former should, on average, have a stronger incentive to maintain or achieve a desired credit rating than the latter.

4.2. Multivariate tests of H1

The following logit regression model is specified to test H1.

$$\begin{aligned} occurn_{t+1} &= \alpha_0 + \alpha_1 notchimpending_t (broadimpending_t) + \alpha_2 entryco_t + \alpha_3 substi_t \\ &+ \alpha_4 mktsize_t + \alpha_5 debt_t + \alpha_6 changedebt_{t+1} + \alpha_7 rd_t + \alpha_8 flexibility_t + \alpha_9 roa_t + \alpha_{10} sga_t \\ &+ \alpha_{11} size_t + \alpha_{12} bm_t + \alpha_{13} marketpower_t + \alpha_{14} surprise_t + \alpha_{15} litigation_t + \alpha_{16} capitalexp_t \\ &+ \alpha_{17} earningsvol_t + \alpha_{18} abtradvol_t + \alpha_{19} abret_t + \alpha_{20} investmentspec_t + \varepsilon \end{aligned} \quad (1)$$

occurn equals 1 if a firm has a PBE plan announcement during the fiscal quarter t+1 and 0 otherwise. *notchimpending* (*broadimpending*) equals 1 if a firm is close to a notch (broad) rating change at the end of the fiscal quarter t and 0 otherwise. Decisions by managers to disclose PBE information are subject to proprietary costs of disclosures. Following Karuna (2007), I use three dimensions of product market competition, product substitutability (*substi*), market size (*mktsize*), and entry costs (*entryco*), as proxies for the proprietary costs. Disclosures of PBE plans increase a firm's risk of leaking its relevant proprietary information to product market competitors. A firm that has lower product substitutability (*substi*), lower entry costs (*entryco*), or larger market size of competing products (*mktsize*) faces more intense industry-level product market competitions, and thus is subject to higher proprietary costs of disclosures (Huang, Jennings, and Yu, 2017). Thus, *occurn* should be positively associated with *substi* and *entryco* and negatively associated with *mktsize*.

Following prior research (e.g., Nichols, 2010), I control for other potential determinants of the incidence of a firm's PBE disclosures: earnings surprise (*surprise*), book-to-market ratio (*bm*), firm size (*size*), capital expenditures (*capitalexp*), product market power (*marketpower*), selling, general & administrative expense (*sga*), research and development expense (*rd*), return on assets (*roa*), financial flexibility (*flexibility*), industry-level litigation risk (*litigation*), earnings volatility (*earningsvol*), financial leverage (*debt*), changes in future leverage (*changedebt*), and distance to investment-grade distinction (*investmentspec*). I include two other variables, abnormal trading volume (*abtradvol*) and abnormal stock returns (*abret*), to control for the impact of potential fundamental-related events on managerial voluntary disclosures. All the variables in model (1) are defined in Appendix I. If H1 holds, the coefficients on *notchimpending* and *broadimpending* should be significantly positive.

H1a suggests that for firms that are subject to higher proprietary costs of disclosures, an impending credit rating change has less positive impact on the incidence of a PBE disclosure. I test H1a by forming two portfolios based on the sample median of the proxy for proprietary costs of disclosures (*propri*). *propri* is constructed by using factor analysis to extract a composite measure of product substitutability (*substi*), market size (*mktsize*), and entry costs (*entryco*), the proprietary-cost proxies used in Karuna (2007). High value of *propri* represents high proprietary costs of disclosures for a firm. I use model (1) to compare the impact of impending credit rating changes on the incidence of a PBE disclosure between the high *propri* portfolio and the low *propri* portfolio.

4.3. Multivariate test of H2

The following logit regression model is used to test H2.

$$gnewsnf_{t+1} = \alpha_0 + \alpha_1 notchimpending_t (broadimpending_t) + \alpha_2 entryco_t + \alpha_3 substi_t + \alpha_4 mktsize_t + \alpha_5 debt_t + \alpha_6 changedebt_{t+1} + \alpha_7 rd_t + \alpha_8 flexibility_t + \alpha_9 roa_t + \alpha_{10} size_t + \alpha_{11} bm_t + \alpha_{12} marketpower_t + \alpha_{13} surprise_t + \alpha_{14} litigation_t + \alpha_{15} abtradvol_t + \alpha_{16} abret_t + \alpha_{17} investmentspec_t + \varepsilon \quad (2)$$

gnewsnf equals 1 if the cumulative abnormal returns (CAR) in the three-day [-1, 1] window surrounding a firm's PBE plan announcement are positive at the fiscal quarter t+1 and 0 otherwise.[9] The cumulative abnormal returns are calculated using a market model with an estimation period of [-210, -11] relative to the announcement date.[10] Existing literature well documents the conflict of interests between shareholders and bondholders (e.g., Jensen and Meckling, 1976; Myers, 1977; Myers and Majluf, 1984). In the case of the shareholder-debtholder conflict, business expansion might incorporate risky investments that increase the value of equity and decrease the value of outstanding debt (Jensen and Meckling, 1976). Thus, some business expansion, even if implying good news for shareholders, might not be good news as well for bondholders. To address this concern, I use another good news proxy which is constructed based on bond returns.[11] In this respect, the dependent variable in model (2) equals 1 if buy-and-hold raw bond returns, adjusted by contemporaneous U.S. treasury returns, over three days centered on a firm's PBE plan announcement are positive and 0 otherwise. The calculation of the treasury-adjusted bond returns follows the procedure employed by Easton, Monahan, and Vasvari (2009).

[9] The classification of news type for voluntary disclosures pertains to a subjective judgment on which reasonable researchers/practitioners hold different perspectives and could reasonably disagree to a substantive extent. Therefore, following Noe (1999), Cheng and Lo (2006), Brockman, Khurana, and Martin (2008), Ge and Lennox (2011), and Nichols (2010), among others, I use stock market reactions to identify the news type of disclosures.

[10] I also apply OLS regression to model (2) using a continuous variable, *car*, as the dependent variable, where *car* measures the magnitude of disclosure news and equals the stock/bond CAR for PBE plan announcements. In the regression results (not tabulated), the coefficient on *notchimpending* (*broadimpending*) is statistically insignificant, suggesting that confronted with an impending notch (broad) rating change, a firm does not manipulate the magnitude of the disclosure news either.

[11] Unlike stock trading, bond trading does not occur on most of the calendar dates in a year. So, the bond-CAR measure used in corporate event studies usually gives rise to an inordinate proportion of either type I errors (i.e., over-rejecting the null hypothesis of no abnormal bond returns) or type II errors (i.e., under-rejecting the null hypothesis of no abnormal bond returns). Therefore, I still reserve the stock-CAR measure as the good news proxy for the empirical tests of H2.

It is possible that the announcement returns used to capture the disclosure news also incorporate the risk-reducing effect of disclosures (i.e., reduction in information asymmetry due to the incidence of a disclosure). But this concern is minimal because the test of H2 is conditioned on firms that deliver a PBE disclosure over a fiscal quarter. Because all the sample observations are restricted to those that have PBE disclosures, the risk-reducing effect of disclosures would have been offset and eliminated in the regression analyses. The treatment variables are *notchimpending* and *broadimpending*, which are defined previously.

Based on prior research (e.g., Verrecchia, 1983; Karuna, 2007; Nichols, 2010), I include the following control variables in model (2): product substitutability (*substi*), market size (*mktsize*), entry costs (*entryco*), earnings surprise (*surprise*), book-to-market ratio (*bm*), firm size (*size*), return on assets (*roa*), product market power (*marketpower*), financial leverage (*debt*), changes in future leverage (*changedebt*), distance to investment-grade distinction (*investmentspec*), abnormal trading volume (*abtradvol*), abnormal stock returns (*abret*), and industry-level litigation risk (*litigation*). These control variables might be potentially associated with the announcement effects of PBE disclosures. All the variables are defined in detail in Appendix I. If firms near a rating change do not selectively release good news or suppress bad news on PBE information, H2 holds and α_1 would be statistically insignificant.

5. Empirical results

5.1. Descriptive statistics

Table 2 presents descriptive statistics of the variables used in the main regression analyses. The measures of *gnewsnf* are constructed based on the subsample of firms that have a PBE disclosure over a fiscal quarter, while the rest of the variables are measured based on the full

sample of rated firms. The mean value of the dichotomous variable, *occurn*, indicates that 22.01% of the full sample observations have at least one announcement of PBE plans. The mean value of *gnewsnf* measured by stock/bond CAR indicates that more than half of the announcements of PBE plans pertain to good news disclosures. This is in line with Nichols (2010) who finds that managers are more likely to convey good news in the announcements of PBE plans.

5.2. Univariate results

Panel A (Panel B) of Table 3 tabulates the PBE disclosure characteristics for firms near a notch (broad) rating change versus firms not near a notch (broad) rating change. The incidence of a PBE disclosure for firms near a notch rating change amounts to 0.2936, which is significantly higher than the incidence of the disclosure for firms not near a notch rating change (i.e., 0.1645). The likelihood of a PBE disclosure is also significantly higher for firms close to a broad rating change (0.2438) than for firms not close to a broad rating change (0.1604). These results suggest that firms confronted with an impending rating change are more likely to deliver a PBE disclosure, which is consistent with H1.

When good news on PBE plans is measured based on its announcement effect in stock market, the probability of the good news disclosure is 0.5082 for firms near a notch rating change, compared to a lower likelihood of 0.5023 for firms not close to a notch rating change. But the mean difference is only 0.59% and statistically insignificant (*t*-stat.=0.54). Firms close to a broad rating change have a lower likelihood of releasing good news PBE disclosure than firms not close to a broad rating change (50.70% vs. 51.03%), but the mean difference amounts to only -0.0033 and is statistically insignificant (*t*-stat.=-0.26). These results are consistent with H2 and remain

qualitatively the same when the disclosure news is measured using abnormal bond returns around the PBE plan announcements.

5.3. Multivariate results for tests of H1 and H2

Table 4 presents the regression results for the tests of H1. The coefficients on *notchimpending* and *broadimpending* are significantly positive, suggesting that firms facing an impending rating change are more likely to deliver a PBE disclosure to increase information transparency. The marginal effect of d(prob.*occurn*)/d(*notchimpending*) (d(prob.*occurn*)/d(*broadimpending*)) is 6.20% (6.18%), suggesting that one unit increase in *notchimpending* (*broadimpending*) leads to an increase in the incidence of a PBE disclosure by 6.20 (6.18) percentage points. The positive impact of the impending rating change is still evident when the dependent variable is broken into the product-disclosure-only case and the business-expansion-disclosure-only case, respectively. Consistent with Karuna (2007), the proprietary-cost variables have statistically significant coefficients in the predicted sign, except *substi*.

Panel A of Table 5 reports the regression results for the tests of H1a. In Columns (1-2), the coefficient on *notchimpending* is significantly positive in the low-proprietary-cost (*propri*) portfolio (0.7392, p=0.010), but is not statistically significant in the high-*propri* portfolio (0.2734, p=0.225). The difference in the coefficient for *notchimpending* between the high- and low-*propri* portfolios is highly significant at the 1% level. This suggests that when a firm is subject to low proprietary costs of disclosures, impending notch rating changes have a more pronounced effect, statistically and economically, on managerial propensity to release PBE plans. Columns (3-4) show that the coefficient for *broadimpending* is significantly positive in the low-*propri* portfolio (0.8234, p=0.004), whereas the coefficient for *broadimpending* in the high-*propri* portfolio is not

statistically significant (0.2794, p= 0.139). This suggests that firms confronted with an impending broad rating change have an incentive to release PBE plans only when the firms are subject to low proprietary costs of the disclosures.

I also partition the sample into two portfolios based on the sample median of product substitutability (*substi*), market size (*mktsize*), and entry costs (*entryco*), respectively. Small magnitude of *mktsize* and large magnitude of *substi* and *entryco* denote low proprietary costs of PBE disclosures. Panels B, C, and D of Table 5 report the regression results based on the partitioned subsamples, where the intercepts and the regression coefficients for the control variables are omitted for brevity. Panel B shows that the coefficients for *notchimpending* and *broadimpending* are more positive, both statistically and economically, in the high-product-substitutability (*substi*) portfolio than in the low-*substi* portfolio. Panel C presents a positive and significant coefficient on both *notchimpending* and *broadimpending* in the low-market-size (*mktsize*) portfolio, but an insignificant coefficient for *notchimpending* and *broadimpending* in the high-*mktsize* portfolio. In Panel D, both *notchimpending* and *broadimpending* take on a significant, positive coefficient in the high-entry-costs (*entryco*) portfolio, but a statistically insignificant coefficient in the low-*entryco* portfolio. Collectively, the results suggest that the positive, significant impact of impending credit rating changes on managers' commitment to releasing PBE plans is evident only for firms that are subject to low proprietary costs of disclosures.

An alternative explanation for the H1 results is that rating agencies delay making a credit rating change for a firm when anticipating its forthcoming disclosures of PBE plans. However, this point cannot explain the differential results in Table 5 for firms with high proprietary costs versus firms with low proprietary costs. Or rather, if the alternative explanation held, we should have observed in Table 5 the significant impact of impending credit rating changes on PBE

disclosures even for firms that are subject to high proprietary costs. Furthermore, the alternative explanation requires that rating agencies have the ability to accurately anticipate forward-looking disclosures of PBE plans. Unlike earnings announcements, disclosures of the PBE news are not scheduled and are released sporadically, so it is unclear whether rating agencies can have a good ability to foresee such news announcements.

Table 6 reports the results for the tests of H2. The coefficients on both *notchimpending* and *broadimpending* are statistically insignificant, irrespective of whether the good news measure is based on abnormal stock returns or on abnormal bond returns around the PBE plan announcements. This indicates that firms do not selectively release good news or withhold bad news on PBE information during an impending rating change.[12] This is probably because managers foresee a high likelihood of the subsequent discovery of bad news hoarding in the repeated game setting of impending credit rating changes. This result reconciles with Stocken's (2000) analytical evidence that in repeated games, managers tend to disclose information credibly.

If PBE disclosures are bundled with contemporaneous earnings announcements, the return-based measures of PBE disclosure news may introduce bias into my earlier results. To address this concern, I regress *gnewsnf* on earnings surprise (i.e., reported EPS minus the median consensus analyst forecast of EPS issued within 90 days prior to the actual EPS announcement date) for those "bundled" PBE disclosure observations, and treat the residual as the market response to the PBE disclosure news only. If the residual is positive (negative), the PBE disclosure is classified as a good (bad) news disclosure. For the PBE disclosures made in conjunction with management earnings forecasts, I apply a similar procedure to distinguish the PBE-disclosure-related news from the forecast-related news. Specifically, I regress *gnewsnf* on earnings forecast news (i.e., managers'

[12] Inferences from the results for the tests of H2 remain unchanged if I use the top third or top quartile of abnormal stock/bond returns as the cutoff for the good news classification.

forecast of EPS minus the median consensus analyst forecast of EPS issued within 90 days prior to the management forecast date) to obtain the residual for the disclosure news classification. I obtain similar results and inferences for H2 when using these alternative news measures for PBE disclosures.[13]

The tests of H2 are conditioned on management's decisions to voluntarily disclose PBE plans. This might give rise to sample selection bias because observations which are near a credit rating change but do not have a PBE disclosure are omitted from the regression analyses. Hence, I conduct a multinomial logit regression for model (2) using the full sample, whereby the potential selection bias could be corrected (Bourguignon, Fournier, and Gurgand, 2007). The inferences for H2 remain unchanged for the multinomial logit specification. I also employ a two-stage Heckman (1979) Inverse-Mills-ratio method to control for the potential sample selection bias. A logit model is used for the first-stage regression that is modeled by model (1). The Inverse Mills ratio estimated from the first-stage regression is then included in the second-stage regression, which is modeled by model (2), to control for the selectivity bias. The results for the coefficients on *notchimpending* and *broadimpending* (not tabulated) under the Heckman Inverse-Mills-ratio specification are qualitatively identical to those reported in Table 6.

In sum, the results suggest that firms close to a rating change credibly commit to maintaining disclosure transparency. The lack of managers' incentives to selectively release good news or withhold bad news on PBE information is consistent with managers' genuine intent of reducing

[13] Alternatively, I remove those PBE plan announcements which occur within one day around earnings announcements or management earnings forecasts, and obtain almost identical results. Other types of nonfinancial disclosures occur far less frequently than management earnings forecasts. So, I assume that the other nonfinancial disclosures that coincide with PBE plan announcements account for an insignificant portion in my sample. I also assume that all the nonfinancial disclosures coincide with each other in a random manner. Under these two assumptions, the results for the tests of H2 won't have been qualitatively affected even though I fail to eliminate other types of nonfinancial disclosures due to the data limit.

information asymmetry between insiders and outsiders for a desired credit rating. The information asymmetry, once reduced, would lead to rating agencies' expectations about a firm's higher creditworthiness.

6. Supplemental tests

6.1. Separate impending rating upgrades from impending rating downgrades

I separate the effect of impending credit rating upgrades on the incidence of a PBE disclosure from the effect of impending rating downgrades. To this end, I replace *notchimpending* (*broadimpending*) with *splus* and *sminus* (*plus* and *minus*) in model (1) and re-run the logit regression. *splus* (*sminus*) equals 1 if a firm is near a notch rating upgrade (downgrade) and 0 otherwise. *plus* (*minus*) equals 1 if a firm's credit rating is close to a broad rating upgrade (downgrade) and 0 otherwise.

Table 7 reports the regression results. Both *splus* and *plus* have a positive, significant coefficient (0.6561 and 0.5759, p=0.007 and 0.010, respectively). The marginal effects for *splus* and *plus* amount to 0.0912 and 0.0776, respectively, indicating that the results are not only statistically significant but also economically significant. The coefficient on *minus* is also significantly positive, indicating that the positive effect of impending rating changes on managerial proclivity to release PBE plans holds for the impending broad rating downgrade case as well. Following the same separation procedure to rerun model (2) yields results consistent with H2 for firms near a rating upgrade and firms near a downgrade, respectively.

Rating agencies, who deal with their clients repeatedly in the long run, are specialized and sophisticated in processing corporate information and are likely able to unravel negative information withheld by clients. If a firm close to a rating downgrade withholds bad news, when

the bad news is discovered by rating agencies, or when the firm cannot withhold the bad news any longer, the firm will suffer from an even more severe rating downgrade. The greater rating downgrade stems from two forces. First, given the bad news, the firm is subject to the rating downgrade that it should have had earlier on. Second, the firm is penalized for withholding bad news (i.e., not being honest) earlier. This explains why managers do not withhold bad news during an impending rating downgrade.

6.2. Control for firm-fixed effects

There might be a time-invariant aspect of managerial voluntary disclosure decisions that is driven by some unobserved firm characteristics. To address this issue, I run firm-fixed-effects logit regression for model (1). The firm-fixed-effects regression results (not tabulated) indicate that the coefficients on *notchimpending* and *broadimpending* become statistically insignificant. However, such results need to be interpreted with caution for two reasons. First, similar to Kisgen (2006), my hypotheses pertain to a both time-series and cross-sectional prediction. But the firm-fixed-effects test relies only on time-series variation in impending credit rating status to identify the relationship between impending credit rating changes and managerial voluntary disclosures. Furthermore, the within-firm variance of credit rating status is not sufficiently large, especially relative to the between-firm variance of credit rating status, which reduces the effectiveness of the fixed-effects tests.[14] This is in line with Kisgen's (2006) explanation for why his results regarding firms near a credit rating change issuing less debt relative to equity are not robust to controlling for fixed effects. Second, the firm-fixed-effects test automatically drops firm-quarter observations

[14] Consistent with the assertion by Kisgen (2006), my untabulated results reveal that for the sample used for the multivariate test of H1, the average within-firm variance of *notchimpending* (*broadimpending*) amounts to 0.4017 (0.4122), and is significantly smaller than the average between-firm variance of *notchimpending* (*broadimpending*) which is 0.4609 (0.4856).

that have no within-firm variation in the dependent variable. This would be more evident when the firm-fixed-effects test is applied to a logit regression model in which the dependent variable is binary. Using the firm-fixed-effects logit model, my sample used for the test of H1 drops by around 80%, which significantly reduces the power of the tests.[15] As documented by Larcker and Rusticus (2010), a firm-fixed-effects specification is unlikely to work in the disclosure context because time-series variation in disclosures is often small.

Since the firm-fixed-effects logit regression model does not work effectively in controlling for firm-fixed effects in the tests of H1, I instead include the lagged incidence of PBE disclosures (*lagoccurn*) in model (1) to mitigate the firm-fixed-effects problem. *lagoccurn* is coded as 1 if a firm has a disclosure of PBE plans in the lagged fiscal quarter and 0 otherwise. Given the stickiness of PBE disclosures, *lagoccurn* should be positively related to *occurn*. As predicted, the regression results, reported in Columns (1-2) of Table 8, indicate that the coefficient on *lagoccurn* is positive and statistically significant at the 1% level. Still, the coefficients for *notchimpending* and *broadimpending* are statistically significant with the positive sign (0.2160 and 0.3430, p=0.044 and 0.001, respectively). As an alternative approach to alleviate the firm-fixed-effects concern, I also include two-digit SIC-code industry dummies in model (1). Columns (3-4) of Table 8 report the results: the coefficients on *notchimpending* and *broadimpending* remain positive and statistically significant (0.3365 and 0.4957, p=0.037 and 0.001, respectively).

In addition, I estimate firm-fixed-effects regression for model (2) to control for omitted time-invariant, firm-specific factors that affect managerial propensity to selectively disclose good news or withhold bad news on PBE information. While the number of sample observations used in the

[15] Based on the conceptual arguments for H1, time-series variation in credit rating status also explains the incidence of a PBE disclosure. So, the observations that lack within-firm variance in the incidence of a PBE disclosure should not be excluded but would have been dropped if the firm-fixed-effects logit regression is applied to model (1).

firm-fixed-effects test approximates that reported in Table 6, the regression results (not tabulated) indicate that the coefficients on *notchimpending* and *broadimpending* are statistically insignificant, which is consistent with H2.

6.3. The role of increased PBE disclosures in the likelihood of a future credit rating upgrade

Prior studies (e.g., Yu, 2005) provide evidence that rating agencies incorporate disclosure transparency into the evaluation of a firm's creditworthiness. PBE disclosures have strong implications for long-term streams of a firm's future earnings and cash flow. Holding all else constant, the public release of PBE information should be effective in reducing information asymmetry between management and external stakeholders. The reduction in information asymmetry not only decreases agency risk faced by external stakeholders, but also facilitates external financing and promotes investment efficiency, thereby increasing the expected value of a firm's future cash flow. In anticipation of the increase in the projected cash flow due to the disclosure transparency, rating agencies would revise upwards their assessed level of a firm's creditworthiness, resulting in a higher likelihood of a rating upgrade for the firm. In this regard, if a firm commits to higher disclosure transparency by increasing disclosures of PBE information, ceteris paribus, the firm should be more likely to get its rating upgraded following the increase in the PBE disclosures. To test this prediction, I estimate the following ordered logit regression for all the rated firms over my sample period.

$$\begin{aligned}\Delta rating_{t+1} = {} & \alpha_0 + \alpha_1 \Delta freq_t + \alpha_2 \Delta tasset_t + \alpha_3 \Delta oi_t + \alpha_4 \Delta debt_t + \\ & \alpha_5 \Delta lev_t + \alpha_6 rating_t + \alpha_7 abtradvol_t + \alpha_8 abret_t + (\alpha_9 CAR_t +) \varepsilon\end{aligned} \tag{3}$$

Credit rating reported in Compustat pertains only to a firm's rating status at the end of a fiscal quarter. Accordingly, $\Delta rating$ is the difference between credit rating at the end of the fiscal quarter t+1 and rating at the end of the fiscal quarter t, which captures a rating change that occurs on any

date during the fiscal quarter t+1. Δ*freq* equals the PBE disclosure frequency for the fiscal quarter t minus the PBE disclosure frequency for the fiscal quarter t-1. Based on prior studies (e.g., Kisgen, 2006; Ashbaugh-Skaife, Collins, and LaFond, 2006) and rating methodologies of Standard & Poor's rating agency, we also include change in firm size (Δ*tasset*), change in profitability (Δ*oi*), change in financial leverage (Δ*debt*), and change in liabilities-to-assets ratio (Δ*lev*) as the control variables in model (3). It is relatively difficult for a firm to obtain a rating upgrade if its existing rating level is high. So, I control for the credit rating level for the quarter t (*rating*). Abnormal trading volume (*abtradvol*) and abnormal stock returns (*abret*) are also included to control for the effect of potential fundamental-related events that might drive future changes in credit ratings.[16] All the control variables are defined in Appendix I. Further, I augment model (3) with *car* to control for the news content of PBE disclosures since it may also drive future credit rating changes. I measure *car* as the average of the three-day-window cumulative abnormal stock/bond returns for all the PBE plan announcements during the fiscal quarter t. *car* is coded as 0 if a firm does not have a PBE disclosure during the fiscal quarter t.

Table 9 reports the regression results. The coefficient on Δ*freq* in Column (1) is 0.0475 and statistically significant at the 5% level. This indicates that a firm is more likely to get its rating upgraded in period t+1 if the firm increases its disclosures on PBE plans in period t. Columns (2-3) tabulate the regression results for model (3) augmented by *car*. Both stock *car* and bond *car* take on a positive and significant coefficient, suggesting that good news PBE disclosure in the quarter t raises the likelihood of a rating upgrade in the quarter t+1. However, the positive coefficient on Δ*freq* becomes less significant after controlling for stock *car*. This might be because *car* could also incorporate the beneficial effects of increased disclosures (i.e., the role of increased

[16] Alternatively, I exclude firm-quarter observations that have an announcement of equity issuance, merger, acquisition, or repurchase over the fiscal quarter t. The results after the exclusion remain qualitatively unchanged.

disclosures in reducing information asymmetry) and thereby may partially subsume Δ*freq* in explaining Δ*rating*. Results remain qualitatively the same if I expand the time horizon for rating revision to two-quarters, three-quarters, and one-year ahead, respectively. Lastly, it is important to note that the positive coefficient on *car* per se by no means tells whether selective disclosures of good news or suppression of bad news would have a favorable impact on a firm's future credit rating. Thus, the results in Columns (2-3) of Table 9 have no contradiction with my earlier results for H2.

7. Conclusion

Credit ratings are important to a firm due to their impact on stock and bond valuations, as well as to the regulatory and contractual costs (benefits) associated with a credit rating change (e.g., Kisgen, 2006; Kisgen, 2009). Therefore, managers have an incentive to improve their credit ratings through influencing rating agencies' perceptions about firm credit quality. Kisgen (2006) shows that firms near a credit rating change issue less debt relative to equity than firms not near a change in ratings, suggesting that firms tend to adjust leverage to influence credit ratings. Nonetheless, in addition to a firm's leverage, rating agencies rely on publicly disclosed corporate information to evaluate a firm's creditworthiness (Standard & Poor's, 2009). Compared to a change in leverage, which requires material transaction costs and long execution time (Kisgen, 2006), an adjustment in voluntary disclosures could be easier. Thus, if managers care about credit ratings, they should also have an incentive to affect rating agencies' perceptions through corporate disclosures.

This study is the first to provide evidence on how managerial incentives to influence credit ratings affect corporate voluntary disclosures. I categorize firms near a rating change as having a

higher incentive to improve credit ratings. My empirical findings suggest that firms tend to commit to credible information disclosures to affect rating agencies' perceptions. In particular, firms near a credit rating change have a higher incidence of disclosing PBE plans. The impending rating change has a more salient, positive effect on managerial propensity to release PBE information when a firm is subject to low proprietary costs of disclosures. This implies that managers tend to trade off both the benefits and costs of disclosures. I find no evidence that facing an impending credit rating change, firms are more likely to selectively release good news or withhold bad news on PBE plans. The credible commitment to the voluntary disclosures reduces information asymmetry between insiders and outsiders, thus leading to rating agencies' expectations about a firm's higher creditworthiness. Consistent with this view, my further analysis reveals that an increase in PBE disclosures results in a higher likelihood of a rating upgrade in the subsequent period.

Appendix I **Summary of variable definitions**

Dependent variables	**Definitions**
occurn	1 if a firm voluntarily makes a PBE disclosure during a fiscal quarter and 0 otherwise.
gnewsnf	1 if three-day [-1, 1] cumulative abnormal stock/bond returns around a firm's PBE plan announcement are positive, and 0 if the cumulative abnormal returns are negative. The abnormal stock returns are calculated using market model with an estimation period of [-210, -11] relative to the announcement date for a firm. The abnormal bond returns are measured as buy-and-hold raw bond returns adjusted by the contemporaneous U.S. treasury returns over three days surrounding the firm's PBE plan announcement.
Δ*rating*	The change in credit rating level for a firm during a fiscal quarter. The rating level (*rating*) is transformed into conventional numerical scores using an ordinal scale ranging from 1 for the lowest rated firms (D) to 22 for the highest rated firms (AAA).

Independent variables	**Definitions**
notchimpending	1 if a firm is near a notch credit rating change at the end of a fiscal quarter and 0 otherwise.
broadimpending	1 if a firm's credit rating is near a broad credit rating change at the end of a fiscal quarter and 0 otherwise.
splus	1 if a firm is near a notch rating upgrade at the end of a fiscal quarter and 0 otherwise.
sminus	1 if a firm is near a notch rating downgrade at the end of a fiscal quarter and 0 otherwise.
plus	1 if a firm's credit rating is near a broad rating upgrade at the end of a fiscal quarter and 0 otherwise.
minus	1 if a firm's credit rating is near a broad rating downgrade at the end of a fiscal quarter and 0 otherwise.
lagoccurn	1 if a firm voluntarily makes a PBE disclosure during a fiscal quarter, which precedes the quarter for which *occurn* is measured, and 0 otherwise.
size	The natural logarithm of the market value of a firm's common equity at the end of a fiscal quarter.
litigation	1 for firms in the biotechnology (2833-2836 and 8731-8734), computers (3570-3577 and 7370-7374), electronics (3600-3674), and retail (5200-5961) industries and 0 otherwise.
earningsvol	The standard deviation of quarterly earnings over 12 quarters ending at the end of a fiscal quarter.
bm	The book value of common equity divided by the market value of the equity at the end of a fiscal quarter.
debt	Long-term debt divided by the market value of equity at the end of a fiscal quarter.
changedebt	Long-term debt divided by the market value of equity at the end of a fiscal quarter, minus long-term debt divided by the market value of equity at the end of the previous fiscal quarter.
sga	Selling, general, and administrative expense, divided by income before extraordinary items, for a fiscal quarter.
rd	Research and development expense, divided by income before extraordinary items, for a fiscal quarter.
flexibililty	Short-term investments plus cash holdings, divided by total assets, at the end of a fiscal quarter.
investmentspec	Distance to the investment-grade credit rating distinction, which equals 10 for AAA, 9 for AA+, 8 for AA, 7 for AA-, 6 for A+, 5 for A, 4 for A-, 3 for BBB+, 2

	for BBB, 1 for BBB- and BB+, 2 for BB, 3 for BB-, 4 for B+, 5 for B, 6 for B-, 7 for CCC+, 8 for CCC, 9 for CCC-, 10 for CC, 11 for C.
entryco	The natural logarithm of the average gross PPE for all firms in a 4-digit SIC industry for a fiscal quarter weighted by each firm's sales in the same industry (in millions of U.S. dollars).
mktsize	The natural logarithm of the sum of sales of all firms in a 4-digit SIC industry for a fiscal quarter (in millions of U.S. dollars).
substi	The sum of operating costs of all firms in a 4-digit SIC industry for a fiscal quarter, divided by the sum of sales for all firms in the same industry (in millions of U.S. dollars).
capitalexp	Capital expenditures divided by total assets for a fiscal quarter.
marketpower	A firm's sales as a percentage of sales for all firms in the same two-digit SIC industry for a fiscal quarter.
surprise	EPS for the current quarter minus EPS for the same quarter in the previous year.
roa	Income before extraordinary items divided by total assets for a fiscal quarter.
freq	The frequency of voluntary disclosures of PBE plans over a fiscal quarter, minus the frequency of the voluntary disclosures over the previous fiscal quarter.
Δ*tasset*	The natural logarithm of total assets at the end of a fiscal quarter minus the natural logarithm of total assets at the end of the same fiscal quarter in the previous year.
Δ*oi*	Earnings before interests and taxes divided by total assets at the end of a fiscal quarter, minus earnings before interests and taxes divided by total assets at the end of the same fiscal quarter in the previous year.
Δ*debt*	Long-term debt divided by the market value of equity at the end of a fiscal quarter, minus long-term debt divided by the market value of equity at the end of the same fiscal quarter in the previous year.
Δ*lev*	Total liabilities divided by total assets at the end of a fiscal quarter, minus total liabilities divided by total assets at the end of the same fiscal quarter in the previous year.
car	The average of three-day window cumulative abnormal stock/bond returns for all the PBE disclosures voluntarily made by a firm during a fiscal quarter, and 0 if the firm does not voluntarily make a PBE disclosure during the fiscal quarter.
abtradvol	The difference between trading volume of the current fiscal quarter and trading volume of the previous fiscal quarter. The trading volume is calculated as the natural logarithm of the average of dollar trading volume (i.e., the product of the closing price and the number of shares traded for a firm) over a fiscal quarter.
abret	The size-adjusted buy-and-hold returns of a firm over a fiscal quarter, which equal the compounded raw returns minus the compounded equally-weighted returns of the same CRSP size decile and the same CRSP exchange index (NYSE/AMEX/ NASDAQ) that the firm belongs to.

Appendix II **Examples of product and business expansion disclosures**

1. An example of product information plan --- American Express Introduces New Online and Mobile Payment Security Services

"*New York, November 3, 2014---American Express today announced the launch of its American Express Token Service, a suite of solutions designed to enable its card-issuing partners, processors, acquirers and merchants to create a safer online and mobile payments environment for consumers.*

With American Express Token Service, traditional card account numbers are replaced with unique "tokens," which can then be used to complete payment transactions online, in a mobile app or in-store with a mobile Near Field Communication (NFC)-enabled device. By using tokens, merchants and digital wallet operators will no longer need to store consumers' sensitive payment account information in their systems. In addition, tokens can be assigned for use with a specific merchant, transaction type or payment device to provide further protection against fraud.

Based on EMVCo's Payment Tokenization Specification and Technical Framework published earlier this year, American Express Token Service offers the following features: (i) a token vault to store and map tokens to card account numbers; (ii) the ability to issue tokens; (iii) lifecycle management services to create, suspend, resume or delete tokens; (iv) additional fraud and risk management services, such as authorization and payment data validation capabilities, for card-issuing financial institutions.

American Express Token Service is available in the U.S., and international rollout is expected to begin in 2015.

"*We believe our payments network is a tremendous asset to American Express – one that will allow us to offer our customers new features and technologies to meet their evolving spending needs," said Paul Fabara, President, Global Banking and Global Network Business, American Express. "As we move ahead, we are excited to bring these new capabilities to our customers and look forward to continuing to serve them."*

American Express also announced that it has developed network specifications for Host Card Emulation (HCE). American Express' HCE specifications provide its card-issuing partners with additional security options and solutions for payments made with mobile NFC-enabled devices that support Android iOS KitKat. With HCE, card issuers use a secure cloud server to store their customers' card account details, which can be transmitted from the cloud server to an NFC-enabled mobile device and then to a Point-of-Sale terminal in a fast, secure manner. American Express' HCE specifications are available today globally."

(Source: Press release from American Express, available at http://about.americanexpress.com/news/pr/2014/amex-intros-online-mobile-payment-security.aspx)

2. An example of business expansion plan --- Apple to Invest €1.7 Billion in New European Data Centres

"*CORK, Ireland---February 23, 2015---Apple today announced a €1.7 billion plan to build and operate two data centres in Europe, each powered by 100 percent renewable energy. The facilities, located in County Galway, Ireland, and Denmark's central Jutland, will power Apple's online services including the iTunes Store, App Store, iMessage, Maps and Siri for customers across Europe.*

"*We are grateful for Apple's continued success in Europe and proud that our investment supports communities across the continent," said Tim Cook, Apple's CEO. "This significant new investment represents Apple's biggest project in Europe to date. We're thrilled to be expanding our operations, creating hundreds of local jobs and introducing some of our most advanced green building designs yet."*

Apple supports nearly 672,000 European jobs, including 530,000 jobs directly related to the development of iOS apps. Since the App Store's debut in 2008, developers across Europe have earned more than €6.6 billion through the worldwide sale of apps.

Apple now directly employs 18,300 people across 19 European countries and has added over 2,000 jobs in the last 12 months alone. Last year, Apple spent more than €7.8 billion with European companies and suppliers helping build Apple products and support operations around the world.

Like all Apple data centres, the new facilities will run entirely on clean, renewable energy sources from day one. Apple will also work with local partners to develop additional renewable energy projects from wind or other sources to provide power in the future. These facilities will have the lowest environmental impact yet for an Apple data centre.

"*We believe that innovation is about leaving the world better than we found it, and that the time for tackling climate change is now," said Lisa Jackson, Apple's vice president of Environmental Initiatives. "We're excited to spur green industry growth in Ireland and Denmark and develop energy systems that take advantage of their strong wind resources. Our commitment to environmental responsibility is good for the planet, good for our business and good for the European economy."*

The two data centres, each measuring 166,000 square metres, are expected to begin operations in 2017 and include designs with additional benefits for their communities. For the project in Athenry, Ireland, Apple will recover land previously used for growing and harvesting non-native trees and restore native trees to Derrydonnell Forest. The project will also provide an outdoor education space for local schools, as well as a walking trail for the community.

In Viborg, Denmark, Apple will eliminate the need for additional generators by locating the data centre adjacent to one of Denmark's largest electrical substations. The facility is also designed to capture excess heat from equipment inside the facility and conduct it into the district heating system to help warm homes in the neighbouring community.

Apple designs Macs, the best personal computers in the world, along with OS X, iLife, iWork and professional software. Apple leads the digital music revolution with its iPods and iTunes online store. Apple has reinvented the mobile phone with its revolutionary iPhone and App Store, and is defining the future of mobile media and computing devices with iPad."

(Source: Press release from Apple, available at http://www.apple.com/pr/library/2015/02/23Apple-to-Invest-1-7-Billion-in-New-European-Data-Centres.html)

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Table 1
Distribution of credit ratings and the incidence of PBE disclosures

Panel A reports the incidence of disclosures across different years. Panel B presents the incidence of disclosures based on industry membership (two-digit SIC code). The observations are at the firm-quarter level for the sample period of 2002-2009. Panel C presents the full sample distribution of credit ratings at the firm-quarter level. Panel D shows the yearly distribution of credit ratings at the firm-quarter level. The credit ratings pertain to the long-term firm-level credit ratings complied by Standard & Poor's and reported on Compustat. The credit ratings range from AAA (the highest rating) to D (the lowest rating --- debt in payment default).

Panel A: The incidence of PBE disclosures across years

Year	Incidence	Number of observations
2002	0.1239	5052
2003	0.1398	5159
2004	0.1948	5620
2005	0.2218	5744
2006	0.2363	5704
2007	0.2787	5835
2008	0.2809	5618
2009	0.2709	5090

Panel B: The incidence of PBE disclosures across two-digit SIC-code industries

Industry (SIC) distribution	Incidence	Number of observations
Oil and gas (13, 29)	0.0685	2672
Food products (20)	0.2884	1290
Paper and paper products (24–27)	0.0436	1630
Chemical products (28)	0.2496	3434
Manufacturing (30–34)	0.1558	1887
Computer equipment and services (35, 73)	0.5254	5973
Electronic equipment (36)	0.5660	3134
Transportation (37, 39, 40–42, 44, 45)	0.1194	2780
Scientific instruments (38)	0.4585	1880
Communications (48)	0.1234	2601
Electric, gas, and sanitary services (49)	0.0653	3249
Durable goods (50)	0.1240	605
Retail (53, 54, 56, 57, 59)	0.2001	1914
Eating and drinking establishments (58)	0.1075	400
Entertainment services (70, 78, 79)	0.0550	928
Health (80)	0.0033	612
Others	0.0766	8833

Panel C: Frequency and percentage on the entire spectrum of credit ratings

S&P Ratings	Frequency	Percentage (%)	Cumulative percentage (%)
AAA	553	0.84	0.84
AA+	234	0.36	1.20
AA	911	1.39	2.58
AA-	1583	2.41	4.99
A+	2809	4.27	9.26
A	4629	7.04	16.30
A-	4683	7.12	23.43
BBB+	6208	9.44	32.87
BBB	8398	12.77	45.65
BBB-	5870	8.93	54.57
BB+	3544	5.39	59.96
BB	4778	7.27	67.23

BB-	6296	9.58	76.81
B+	6144	9.35	86.15
B	4173	6.35	92.50
B-	2385	3.63	96.13
CCC+	955	1.45	97.58
CCC	558	0.85	98.43
CCC-	152	0.23	98.66
CC	203	0.31	98.97
C	0	0	98.98
D or SD	676	1.03	100
Total	65742	100	100

Panel D: Distribution of credit ratings across years

Freq. of S&P Ratings	2002	2003	2004	2005	2006	2007	2008	2009
AAA	84	79	76	68	68	68	63	47
AA+	46	33	28	25	28	29	23	22
AA	108	101	106	105	104	151	131	105
AA-	259	210	189	188	206	182	197	152
A+	488	429	365	355	337	304	282	249
A	640	621	632	618	559	533	502	524
A-	647	649	606	607	608	563	545	458
BBB+	823	754	798	827	797	764	739	706
BBB	994	1096	1130	1045	1076	995	1007	1055
BBB-	803	741	761	770	668	699	713	715
BB+	458	508	493	460	460	444	367	354
BB	635	591	599	659	648	593	565	488
BB-	727	805	843	873	827	806	767	648
B+	854	849	884	795	807	739	662	554
B	460	494	542	488	495	577	579	538
B-	255	234	294	285	311	292	323	391
CCC+	149	126	110	148	119	82	80	141
CCC	94	105	90	50	41	33	36	109
CCC-	48	40	18	5	9	8	9	15
CC	50	44	21	11	5	11	17	44
C	0	0	0	0	0	0	0	0
D or SD	168	160	88	52	38	28	41	101
Total	8790	8669	8673	8434	8211	7901	7648	7416

Table 2
Descriptive statistics

This table presents the descriptive statistics of the variables used in the main tests. The sample period ranges from 2002 to 2009. The measures of *gnewsnf* and *car* are constructed based on the subsample of firms that have a voluntary disclosure of PBE plans over a fiscal quarter, while the rest of the variable measures are based on the full rated sample. All the variables are defined in Appendix I.

Variables	Mean	Std.dev.	25th	Median	75th	N
Dependent variables						
occurn	0.2201	0.4143	0	0	0	43822
gnewsnf (stock CAR)	0.5057	0.5000	0	1	1	8715
gnewsnf (bond CAR)	0.5469	0.4978	0	1	1	5780
car (stock)	0.0755	0.2728	-0.0001	0.0100	0.0767	8715
car (bond)	0.0721	0.3907	-0.0250	0	0.0785	5780
Independent variables						
notchimpending	0.4370	0.4952	0	0	1	43822
broadimpending	0.6641	0.4723	0	1	1	42972
entryco	7.6835	2.6799	6.4420	8.2646	9.5422	43822
mktsize	9.3890	1.7108	8.2299	9.4768	10.5445	43822
substi	1.0312	0.1925	0.9271	1.0467	1.1418	43822
size	8.0751	1.9563	6.8527	7.9747	9.3037	43822
changedebt	-0.6047	21.2839	-0.0521	0	0.0392	43822
investmentspec	3.5674	2.0743	2	3	5	43822
rd	0.6684	31.2524	0	0	0.1627	43822
flexibility	0.1025	0.1227	0.1412	0.0580	0.0199	43822
sga	7.0777	373.949	2.3681	7.6355	17.7205	43822
bm	1.6999	20.9630	0.2631	0.4588	0.7481	43822
marketpower	0.0652	0.1416	0.0026	0.0102	0.0469	43822
surprise	0.5644	0.4958	0	1	1	43822
litigation	0.1879	0.3907	0	0	0	43822
debt	2.5909	28.8003	0.1313	0.3653	0.8717	43822
capitalexp	0.0310	0.0181	0.0071	0.0181	0.0390	43822
earningsvol	113.725	436.592	6.4145	20.728	80.449	43822
roa	0.0088	0.0411	0.0024	0.0105	0.0209	43822
abtradvol	7.9672	7.7306	0	11.2146	15.4203	43822
abret	6.1434	225.6043	-0.1046	0	0.1156	43822

Table 3
Univariate tests

Panel A (Panel B) reports the descriptive statistics of the PBE disclosure characteristics, partitioned by *notchimpending* (*broadimpending*). *notchimpending* (*broadimpending*) equals 1 if a firm is near a notch (broad) credit rating change and 0 otherwise. N_1 (N_0) in Panel A refers to the number of firm-quarter observations that are (are not) near a notch rating change. N_1 (N_0) in Panel B refers to the number of firm-quarter observations that are (are not) near a broad rating change. All the variables are defined in Appendix I. The sample period ranges from 2002 to 2009. *occurn* is an indicator variable for whether a firm delivers a voluntary disclosure of PBE plans during a fiscal quarter. *gnewsnf* is an indicator variable for whether a firm releases good news on PBE plans over a fiscal quarter. The measure of *occurn* is based on the full sample while the rest of the variable measures are based on the subsample of firms that have a voluntary disclosure of PBE plans over a fiscal quarter.

Panel A: Comparison of the PBE disclosure characteristics by notchimpending

Variables	*notchimpending*=1		*notchimpending*=0		Mean difference
	Mean	N_1	Mean	N_0	(t-stat.)
occurn	0.2936	18875	0.1645	24947	0.1291 (31.77)***
gnewsnf (stock CAR)	0.5082	5020	0.5023	3695	0.0059 (0.54)
gnewsnf (bond CAR)	0.5518	3427	0.5397	2353	0.0121 (0.90)

Panel B: Comparison of the PBE disclosure characteristics by broadimpending

Variables	*broadimpending*=1		*broadimpending*=0		Mean difference
	Mean	N_1	Mean	N_0	(t-stat.)
occurn	0.2438	28536	0.1604	14436	0.0834 (20.98)***
gnewsnf (stock CAR)	0.5070	6300	0.5103	2083	-0.0033 (-0.26)
gnewsnf (bond CAR)	0.5451	4150	0.5610	1312	-0.0159 (-1.01)

Panel A (Panel B) reports the descriptive statistics of the PBE disclosure characteristics, partitioned by. ***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.

Table 4
Multivariate tests of H1

This table reports the logit regression results for the tests of H1. The sample period ranges from 2002 to 2009. The dependent variable is *occurn*, an indicator variable for whether a firm delivers a voluntary disclosure of PBE plans during the fiscal quarter t+1. The treatment variable, *notchimpending* (*broadimpending*), equals 1 if a firm is near a notch (broad) credit rating change during the fiscal quarter t and 0 otherwise. All the variables are defined in Appendix I. Year and quarter dummies are included in the regressions but not reported for brevity. The p-values in parentheses are based on robust standard errors clustered by firm.

Variables	Pred. sign	Dependent variable = *occurn*	
Intercept	?	-6.7825 (<0.001)***	-7.3132 (<0.001)***
notchimpending	+	**0.4782** **(0.012)****	
broadimpending	+		**0.5236** **(0.003)*****
entryco	+	0.1437 (0.025)**	0.1391 (0.033)**
mktsize	-	-0.2467 (0.002)***	-0.2174 (0.005)***
substi	+	0.5152 (0.381)	0.4005 (0.492)
changedebt	+	-0.0049 (0.758)	-0.0003 (0.981)
rd	+	0.0009 (0.490)	0.0009 (0.573)
flexibility	+	4.1879 (<0.001)***	4.2786 (<0.001)***
roa	?	-2.1405 (0.069)*	-2.6082 (0.061)*
sga	+	-0.00005 (0.276)	-0.00003 (0.440)
size	+	0.6122 (<0.001)***	0.6362 (<0.001)***
bm	-	0.0047 (0.369)	0.0030 (0.633)
marketpower	+	0.4764 (0.520)	0.6079 (0.432)
surprise	+	-0.0147 (0.836)	0.0090 (0.900)
litigation	+	0.7503 (0.007)***	0.7073 (0.012)**
debt	+	-0.0139 (0.516)	-0.0044 (0.734)
capitalexp	+	1.7089 (0.415)	1.9969 (0.340)
earningsvol	-	-0.0004 (0.060)*	-0.0004 (0.039)**
abtradvol	?	-0.0177 (<0.001)***	-0.0177 (<0.001)***
abret	?	0.0181 (0.031)**	0.0186 (0.020)**
investmentspec	+	0.1025 (0.038)**	0.1181 (0.040)**
Year & quarter dummies	?	included	included

No. of observations		43822	42972
Pseudo R^2		0.3188	0.3125
Marginal effects:			
d(prob.*occurn*)/d(*notchimpending* or *broadimpending*)	+	0.0620	0.0618

***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.

Table 5
Multivariate tests of *H1a*

Panel A of this table presents the logit regression results for the tests of *H1a*, in which the sample is partitioned by proprietary costs of disclosures (*propri*). *propri* is constructed by using factor analysis to extract a composite measure of product substitutability, market size, and entry costs, the three proprietary-costs proxies used in Karuna (2007) and are defined in Appendix I. Panels B, C, and D report the logit regression results for the tests of H1a, in which firm-quarter observations are partitioned by product substitutability (*substi*), market size (*mktsize*), and entry cost (*entryco*), respectively. Observations are partitioned into two portfolios based on the sample median of *propri*, *substi*, *mktsize*, and *entryco*, respectively. The regression results are reported for the below- (above-) median portfolio. Low (high) *propri* and *mktsize* feature low (high) proprietary costs of disclosures, while high (low) *substi* and *entryco* feature low (high) proprietary costs of disclosures. The sample period ranges from 2002 to 2009. The dependent variable is o*ccurn*, an indicator variable for whether a firm delivers a voluntary disclosure of PBE plans over the fiscal quarter t+1. The treatment variable, *notchimpending* (*broadimpending*), equals 1 if a firm is near a notch (broad) credit rating change over the fiscal quarter t and 0 otherwise. The intercepts and the coefficients for the control variables in Panels B-D are omitted for brevity. The continuous moderator variables (i.e., *propri*, *substi*, *mktsize*, *entryco*), which are dichotomized for partitioning the samples, are retained as controls in the respective subsample regressions. All the variables are defined in Appendix I. Year and quarter dummies are included in the regressions but not reported for brevity. The p-values in brackets are based on robust standard errors clustered by firm.

Panel A: Sample partitioned on propri

Variables	Pred. sign	Dependent variable = *occurn*			
		Low *propri*	High *propri*	Low *propri*	High *propri*
Intercept	?	-7.4323 (<0.001)***	-6.7608 (<0.001)***	-8.3606 (<0.001)***	-7.1797 (<0.001)***
notchimpending	+	**0.7392** **(0.010)*** **	**0.2734** **(0.225)**		
broadimpending	+			**0.8234** **(0.004)*** **	**0.2794** **(0.139)**
changedebt	+	-0.0152 (0.512)	-0.0082 (0.782)	-0.0052 (0.789)	-0.0068 (0.779)
rd	+	0.0011 (0.576)	0.0020 (0.429)	0.0010 (0.677)	0.0021 (0.408)
flexibility	+	4.7760 (<0.001)***	3.7570 (<0.001)***	4.7362 (<0.001)***	3.7444 (<0.001)***
roa	?	-0.2991 (0.908)	-3.1451 (0.012)**	-1.5683 (0.537)	-3.3474 (0.014)**
sga	+	-0.00003 (0.535)	-0.0001 (0.135)	-7.35E-6 (0.865)	-0.0001 (0.126)
propri	-	0.0779 (0.808)	-0.1949 (0.398)	-0.1651 (0.607)	-0.1525 (0.507)
size	+	0.5360 (<0.001)***	0.5983 (<0.001)***	0.5965 (<0.001)***	0.6242 (<0.001)***
bm	-	0.0022 (0.916)	0.0051 (0.273)	0.0045 (0.819)	0.0033 (0.570)
marketpower	+	1.5949 (0.341)	0.5880 (0.483)	1.6748 (0.312)	0.5560 (0.519)
debt	+	-0.0257 (0.508)	-0.0361 (0.376)	-0.0089 (0.678)	-0.0134 (0.610)
surprise	+	-0.0109 (0.922)	-0.0284 (0.742)	0.0516 (0.643)	-0.0355 (0.682)
capitalexp	+	4.9878 (0.025)**	-2.5833 (0.338)	5.5646 (0.012)**	-3.1063 (0.276)
earningsvol	-	-0.0006 (0.064)*	0.0002 (0.565)	-0.0008 (0.005)***	0.0003 (0.460)
litigation	+	1.0229 (0.011)**	0.3892 (0.234)	0.9759 (0.018)**	0.4087 (0.205)
abtradvol	?	-0.0221 (<0.001)***	-0.0116 (0.003)***	-0.0228 (0.001)***	-0.0113 (0.005)***

abret	?	0.0157 (0.005)***	0.0628 (0.062)*	0.0169 (0.003)***	0.0624 (0.069)*
investmentspec	+	0.1349 (0.059)*	0.1046 (0.090)*	0.1317 (0.128)	0.1428 (0.035)**
year & quarter dummies		included	included	included	included
Low *propri* (*notchimpending*/*broadimpending*) > High *propri* (*notchimpending*/*broadimpending*)					
χ^2		**59.61**		**69.94**	
(*p*-value)		**(<0.001)*** **		**(<0.001)*** **	
No. of observations		21918	21904	21252	21720
Pseudo R^2		0.3453	0.2576	0.3392	0.2618

Panel B: Sample partitioned on substi

Variables	Pred. sign	Dependent variable = *occurn*			
		Low *substi*	High *substi*	Low *substi*	High *substi*
notchimpending	+	**0.3531** **(0.105)**	**0.6746** **(0.018)****		
broadimpending	+			**0.2768** **(0.200)**	**0.7294** **(0.005)*****
Low *substi* (*notchimpending*/*broadimpending*) < High *substi* (*notchimpending*/*broadimpending*)					
χ^2		**29.38**		**50.55**	
(p-value)		**(<0.001)*** **		**(<0.001)*** **	
No. of observations		22861	22749	22609	22132
Pseudo R^2		0.1799	0.4066	0.1844	0.3976

Panel C: Sample partitioned on mktsize

Variables	Pred. sign	Dependent variable = *occurn*			
		Low *mktsize*	High *mktsize*	Low *mktsize*	High *mktsize*
notchimpending	+	**0.7893** **(0.008)*****	**0.3657** **(0.095)****		
broadimpending	+			**0.8669** **(0.006)*****	**0.2215** **(0.256)**
Low *mktsize* (*notchimpending*/*broadimpending*) > High *mktsize* (*notchimpending*/*broadimpending*)					
χ^2		**50.10**		**99.44**	
(p-value)		**(<0.001)*** **		**(<0.001)*** **	
No. of observations		22683	22623	21995	22444
Pseudo R^2		0.3408	0.3132	0.3272	0.3142

Panel D: Sample partitioned on entryco

Variables	Pred. sign	Dependent variable = *occurn*			
		Low *entryco*	High *entryco*	Low *entryco*	High *entryco*
notchimpending	+	**-0.0667** **(0.735)**	**0.8684** **(0.001)*****		
broadimpending	+			**0.1753** **(0.355)**	**0.8435** **(0.001)*****
Low *entryco* (*notchimpending*/*broadimpending*) < High *entryco* (*notchimpending*/*broadimpending*)					
χ^2		**227.34**		**107.04**	
(p-value)		**(<0.001)*** **		**(<0.001)*** **	
No. of observations		21813	22009	21632	21340
Pseudo R^2		0.2582	0.3255	0.2624	0.3160

***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.

Table 6
Multivariate tests of H2

This table presents the logit regression results for the tests of H2. The sample period ranges from 2002 to 2009. The dependent variable is *gnewsnf*, an indicator variable for whether a firm releases good news on PBE plans over the fiscal quarter t+1. The treatment variable, *notchimpending* (*broadimpending*), equals 1 if a firm is near a notch (broad) credit rating change during the fiscal quarter t and 0 otherwise. All the variables are defined in Appendix I. Year and quarter dummies are included in the regression but not reported for brevity. The p-values in parentheses are based on robust standard errors clustered by firm.

Variables	Pred. sign	Dependent variable = *gnewsnf* (1)stock CAR	(2)bond CAR	(3)stock CAR	(4)bond CAR
Intercept	?	0.5156 (0.014)**	0.8340 (0.021)**	0.4477 (0.041)**	0.7075 (0.056)*
notchimpending	**?**	**0.0535** **(0.305)**	**0.0440** **(0.597)**		
broadimpending	**?**			**0.0388** **(0.427)**	**0.0012** **(0.990)**
entryco	-	-0.0237 (0.017)**	-6.06E-6 (0.269)	-0.0280 (0.008)***	5.74E-6 (0.271)
mktsize	+	0.0007 (0.971)	4.48E-7 (0.751)	0.0078 (0.710)	7.17E-7 (0.594)
substi	-	-0.0085 (0.941)	0.2500 (0.289)	-0.0037 (0.975)	0.2664 (0.260)
changedebt	?	0.0162 (0.406)	-0.0335 (0.286)	0.0187 (0.021)**	-0.0221 (0.482)
debt	?	0.0035 (0.833)	-0.0335 (0.286)	-0.0012 (0.955)	-0.0221 (0.482)
investmentspec	?	-0.0066 (0.583)	-0.1428 (0.598)	-0.0018 (0.308)	-0.1533 (0.571)
size	-	-0.0227 (0.133)	-0.0335 (0.286)	-0.0223 (0.158)	-0.0221 (0.482)
bm	+	0.0002 (0.989)	-0.2014 (0.021)**	0.0046 (0.765)	-0.1755 (0.041)**
marketpower	+	0.1014 (0.476)	-0.1428 (0.598)	0.0811 (0.582)	-0.1533 (0.571)
surprise	+	-0.0078 (0.874)	0.1627 (0.050)**	-0.0134 (0.793)	0.1660 (0.056)*
roa	-	0.1514 (0.823)	-1.4443 (0.197)	0.2345 (0.724)	-1.9263 (0.090)*
abtradvol	?	-0.0044 (0.158)	2.77E-10 (0.387)	-0.0035 (0.272)	4.19E-10 (0.237)
abret	?	-0.00002 (0.840)	-0.0004 (0.332)	-0.00003 (0.805)	-0.0004 (0.375)
litigation	-	-0.0186 (0.728)	0.0434 (0.645)	-0.0115 (0.827)	0.0489 (0.615)
year & quarter dummies	?	included	included	included	included
No. of observations		8715	5830	8383	5512
Pseudo R^2		0.0041	0.061	0.0036	0.059

***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.

Table 7

Multivariate tests of H1 --- Separate impending credit rating upgrades from impending rating downgrades

This table reports the logit regression results for the tests of H1, in which impending credit rating upgrades are separated from impending rating downgrades in the regression analyses. The sample period ranges from 2002 to 2009. The dependent variable is *occurn*, an indicator variable based on whether a firm delivers a voluntary disclosure of PBE plans during the fiscal quarter t+1. The treatment variables are *splus*, *sminus*, *plus*, and *minus*. *splus* (*plus*) equals 1 if a firm is near a notch (broad) credit rating upgrade over the fiscal quarter t and 0 otherwise. *sminus* (*minus*) equals 1 if a firm is near a notch (broad) credit rating downgrade over the fiscal quarter t and 0 otherwise. All the variables are defined in Appendix I. Year and quarter dummies are included in the regressions but not reported for brevity. The p-values in brackets are based on robust standard errors clustered by firm.

Variables	Pred. sign	Dependent variable = *occurn*	
Intercept	?	-6.3037 (<0.001)***	-7.2945 (<0.001)***
splus	**+**	**0.6561** **(0.007)*** **	
sminus	**+**	**0.0233** **(0.934)**	
plus	+		**0.5759** **(0.010)*** **
minus	+		**0.4723** **(0.007)*** **
entryco	+	0.1411 (0.024)**	0.1379 (0.035)**
mktsize	-	-0.2588 (0.002)***	-0.2159 (0.005)***
substi	+	0.5356 (0.365)	0.4200 (0.469)
changedebt	+	-0.0117 (0.538)	-0.0003 (0.982)
rd	+	0.0007 (0.458)	0.0009 (0.579)
flexibility	+	4.1080 (<0.001)***	4.3021 (<0.001)***
roa	?	-2.1205 (0.062)*	-2.5868 (0.062)*
sga	+	-0.00004 (0.370)	-0.00003 (0.432)
investmentspec	+	0.1238 (0.016)**	0.1155 (0.040)**
size	+	0.5625 (<0.001)***	0.6323 (<0.001)***
bm	-	0.0031 (0.740)	0.0031 (0.614)
marketpower	+	0.4454 (0.545)	0.6302 (0.412)
surprise	+	-0.0291 (0.681)	0.0053 (0.938)
litigation	+	0.7301 (0.007)***	0.7057 (0.013)**
debt	+	-0.0254 (0.408)	-0.0046 (0.724)
capitalexp	+	1.5700 (0.447)	2.0125 (0.335)
earningsvol	-	-0.0004 (0.053)*	-0.0004 (0.038)**
Abtradvol	+	-0.0176 (<0.001)***	-0.0177 (<0.001)***

abret	+	0.0178 (0.031)**	0.0186 (0.019)**
year & quarter dummies	?	included	included
No. of observations		43822	42972
Pseudo R^2		0.3213	0.3126
Marginal effects: d (Prob. *occurn*)/d (*splus or plus*)	+	0.0912	0.0776
d (Prob. *occurn*)/d (*sminus or minus*)	+	0.0029	0.0625

***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.

Table 8

Multivariate tests of H1 --- Control for the lagged incidence of PBE disclosures and industry-fixed effects

This table reports the logit regression results for the tests of H1. The sample period ranges from 2002 to 2009. The dependent variable is *occurn*, which equals 1 if a firm delivers a voluntary disclosure of PBE plans over the fiscal quarter t+1 and 0 otherwise. The treatment variable, *notchimpending* (*broadimpending*), equals 1 if a firm is near a notch (broad) rating change during the fiscal quarter t and 0 otherwise. The additional control variable, *lagoccurn*, is an indicator variable based on whether a firm delivers a voluntary disclosure of PBE plans during the fiscal quarter t. All the variables are defined in Appendix I. Year and quarter dummies are included in all the regressions but not reported for brevity. Industry dummies, which are included in Columns (3-4) but not reported for simplicity, are based on two-digit SIC codes. The p-values in parentheses are based on robust standard errors clustered by firm.

Variables	Pred. sign	Dependent variable = *occurn* (1)	(2)	(3)	(4)
Intercept	?	-5.6022 (<0.001)***	-5.8837 (<0.001)***	-11.0763 (<0.001)***	-9.3042 (<0.001)***
notchimpending	+	**0.2160 (0.044)****	**0.3430 (0.001)*****		
broadimpending	+			**0.3365 (0.037)****	**0.4957 (0.001)*****
entryco	+	0.0732 (0.023)**	0.0740 (0.027)**	0.1657 (0.011)**	0.1589 (0.016)**
mktsize	-	-0.1287 (0.006)***	-0.1177 (0.012)**	-0.1024 (0.260)	-0.1027 (0.259)
substi	+	0.0111 (0.974)	-0.0616 (0.856)	0.2520 (0.686)	0.1227 (0.846)
changedebt	+	0.0027 (0.465)	0.0027 (0.460)	-0.0077 (0.601)	-0.0045 (0.734)
rd	+	0.0003 (0.404)	0.0002 (0.423)	0.0003 (0.446)	0.0002 (0.601)
flexibility	+	2.3672 (<0.001)***	2.3981 (<0.001)***	3.1976 (<0.001)***	3.2654 (<0.001)***
roa	?	-0.6888 (0.061)*	-1.0240 (0.194)	-0.9506 (0.302)	-1.3789 (0.176)
sga	+	1.48E-6 (0.975)	3.77E-6 (0.933)	-0.00005 (0.226)	-0.00004 (0.357)
size	+	0.3103 (<0.001)***	0.3229 (<0.001)***	0.5350 (<0.001)***	0.5526 (<0.001)***
bm	-	0.0044 (0.088)*	0.0028 (0.375)	0.0024 (0.718)	-0.0005 (0.966)
marketpower	+	0.3010 (0.496)	0.3775 (0.398)	0.9819 (0.299)	1.0751 (0.261)
surprise	+	0.0358 (0.602)	0.0544 (0.428)	-0.0667 (0.253)	-0.0337 (0.550)
litigation	+	0.4175 (0.007)**	0.3811 (0.016)**	0.7088 (0.116)	0.6548 (0.171)
debt	+	-0.0068 (0.278)	-0.0032 (0.522)	-0.0151 (0.503)	-0.0066 (0.670)
capitalexp	+	1.0564 (0.392)	1.1936 (0.332)	5.6865 (0.001)***	5.9346 (0.001)***
earningsvol	-	-0.0003 (0.048)**	-0.0003 (0.056)*	-0.0003 (0.171)	-0.0005 (0.014)**
Abtradvol	?	-0.0081 (0.063)*	-0.0076 (0.085)**	-0.0131 (<0.001)***	-0.0131 (<0.001)***
abret	?	0.0128 (0.008)***	0.0132 (0.006)***	0.0197 (0.008)***	0.0200 (0.005)***
investmentspec	+	0.0744 (0.012)**	0.0809 (0.013)**	0.1157 (0.019)**	0.1227 (0.029)**

lagoccurn	+	5.1029 (<0.001)***	0.1181 (0.040)**		
industry dummies	?			included	included
year & quarter dummies	?	included	included	included	included
No. of observations		42139	41328	41630	40796
Pseudo R^2		0.6920	0.6872	0.4247	0.4231

***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.

Table 9

Additional test: The effect of increased PBE disclosures on the likelihood of a future credit rating upgrade

This table reports the ordered logit regression results for the tests as to the effect of increased PBE disclosures on the likelihood of a future credit rating upgrade. The sample period ranges from 2002 to 2009. The dependent variable is Δ*rating*, which denotes change in credit rating level for a firm during the fiscal quarter t+1. The rating level (*rating*) is transformed into conventional numerical scores, using an ordinal scale ranging from 1 for the lowest rated firms (D) to 22 for the highest rated firms (AAA). The treatment variable, Δ*freq*, equals change in the frequency of PBE disclosures during the fiscal quarter t. All the variables are defined in Appendix I. Year and quarter dummies are included in the regressions but not reported for brevity. The p-values in parentheses are based on robust standard errors clustered by firm.

Variables	Pred. sign	Dependent variable = Δ*rating* (1)	(2)	(3)
Δ***freq***	+	**0.0475 (0.038)****	**0.0420 (0.075)***	**0.0476 (0.036)****
Δ*tasset*	+	0.9271 (<0.001)***	0.9278 (<0.001)***	0.9270 (<0.001)***
Δ*oi*	+	5.9998 (<0.001)***	6.1229 (<0.001)***	6.0032 (<0.001)***
Δ*debt*	-	-6.54E-7 (0.615)	-6.46E-7 (0.620)	-6.53E-7 (0.019)**
Δ*lev*	-	-1.8454 (<0.001)***	-1.8509 (<0.001)***	-1.8470 (<0.001)***
car (stock)	+		0.6014 (0.007)***	
car (bond)	+			0.3455 (0.069)*
rating	-	-0.0247 (<0.001)***	-0.0244 (<0.001)***	-0.0247 (<0.001)***
abtradvol	?	-3.44E-10 (0.397)	-3.43E-10 (0.398)	-3.33E-10 (0.412)
abret	?	1.4938 (<0.001)***	1.4803 (<0.001)***	1.4909 (<0.001)***
year & quarter dummies	?	included	included	included
No. of observations		40671	40671	40671
Pseudo R^2		0.042	0.042	0.042

***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed tests), respectively.